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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/524,554	09/07/2005	Richard John Evans	038819.55861US	9119

23911 7590 12/10/2008

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EXAMINER	
FUJITA, KATRINA R	
ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
12/10/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/524,554	EVANS, RICHARD JOHN	
	Examiner	Art Unit	
	KATRINA FUJITA	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 March 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 08, 2008 has been entered.

Response to Amendment

2. This Office Action is responsive to Applicant's remarks received on October 08, 2008. Claims 1-15 remain pending.

3. The Examiner notes that at line 13 of claim 1, there is subject matter added to claim that is not underlined ("at the certain position"). As the Examiner believes Applicant intended to underline the subject matter, it will be treated as if properly added by amendment for the purposes of examination.

Drawings

4. The previous drawing objection has been withdrawn in light of Applicant's amendment.

Claim Objections

5. The following is a quotation of 37 CFR 1.75(a):

> The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.

6. Claims 1 and 15 are objected to under 37 CFR 1.75(a), as failing to particularly point out and distinctly claim the subject matter which application regards as his invention or discovery.

Claim 1 lacks antecedent basis for "the video image" at line 10. The following will be assumed for examination purposes: -- the video ~~image~~ images"--. The same applies to claim 15 at lines 14 and 20.

Claim 1 lacks antecedent basis for "the image" at line 13. The following will be assumed for examination purposes: -- the ~~image~~ video images --. The same applies to claim 15 at line 6.

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. Claims 1-14 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. Supreme Court precedent1[1] and recent Federal Circuit decisions[2] indicate that a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. While the instant claims recite a series of steps or acts to be performed, the claims neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. For example, claim 1 recites steps of receiving, extracting, tracking, using and comparing that are not described in the claim as being accomplished by an apparatus or manufacture, nor do these steps transform subject matter from one state to another.

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[1] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

[2] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1, 2, 9-12, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lou et al. ("Semantic Interpretation…", IEEE article).

Regarding **claim 1**, Lou et al. discloses a method for processing video images to detect an event of interest ("semantic interpretation of vehicles and pedestrians' behaviors is proposed for applications in visual traffic surveillance" at section 1.1, paragraph 2, line 8), comprising:

receiving a video signal representing the video images to be processed ("image sequence used in our experiments is captured from a high building top with a Panasonic® video camera" at section 3.3., paragraph 3, line 6);

extracting at least one point feature from the video signal ("more than 400 trajectories are used" at section 3.3, paragraph 3, line 8);

tracking the position and movement of the at least one point feature within the video images to generate a corresponding at least one track, each of said at least one track representing a corresponding point feature in terms of its position and its velocity within each of the video images ("recording the position, speed and direction of the target at each frame" at section 2, line 11);

using an iterative learning process to derive a normal pattern of behavior for each track for each position within the video images in terms of observed incidences of point feature velocity at said each position ("Trajectory pattern analysis which can automatically classify the trajectories into several patterns" at section 3.1, paragraph 1, line 1; "Learning of trajectory patterns" at section 3);

comparing present behavior of a track at a certain position within the image to the respective derived normal pattern of behavior at the certain position in terms of observed point feature velocity at the certain position ("comparing translational speeds and angular speeds" at section 3.3, paragraph 1, line 17; "trajectory will be classified into the class which gives significant larger post-probability than all other classes" at section 3.4, paragraph 1, line 22); and

in response to the present behavior falling outside the normal pattern of behavior in terms of observed point feature velocity at the certain position, generating a signal ("we can assert that this target is conducting an abnormal behavior, and a warning can be raised" at section 3.4, paragraph 2, line 7).

While the warning signal of Lou et al. is not explicitly an alarm signal, it only follows that the warning signal act as alarm so as to indicate to the user that abnormal activity is occurring and may require further attention.

Regarding **claim 2**, Lou et al. discloses a method wherein the alarm signal causes at least one of the following effects:

draw the attention of the operator ("output module is only activated when one of the following conditions is satisfied…An abnormal event is happening" at section 4,

paragraph 5, line 2; although it is not explicit that the operator's attention is drawn, by indicating on the display that an abnormal even has occurred, the operator will effectively be informed of any such events);

place an index mark at the appropriate place in recorded video data; and

trigger selective recording of video data.

Regarding **claim 9**, Lou et al. does not explicitly disclose that abnormal tracks are filtered, whereby an active alarm signal is generated in response to an abnormal track which resembles a number of other abnormal tracks, in terms of at least one of position, velocity and time.

However, Lou et al. teaches that similar classes may be merged together if they are fairly close to each other (see section 3.4, paragraph 2, lines 11-13). As such, two separate trajectories that are indicated as abnormal that are classified in separate classes may be combined together into a single class provided that they are similar enough.

Therefore, it would have been obvious at the time the invention was made to generate an active alarm in this case to indicate to the operator that these two particular classes may need to be combined upon further inspection such that the classifier may become more streamline.

Regarding **claim 10**, Lou et al. discloses a method wherein abnormal tracks are filtered, whereby an active alarm signal is generated in response only to an abnormal track which has been classified as abnormal on a predetermined number of occasions (i.e. once).

Regarding **claim 11**, Lou et al. discloses a method wherein abnormal tracks are filtered, whereby an active alarm signal is generated in response only to a track being classified as abnormal for the first time ("At the same time, a new class leaf is added into the tree at a proper layer" at section 3.4, paragraph 2, line 9; once the track has its own class, it won't be classified as abnormal as it has its own class characteristics).

Regarding **claim 12**, Watanabe discloses a method wherein abnormal tracks are filtered, whereby an active alarm signal is generated only in response to a filtered version of the classification rising above a predetermined threshold value ("no existing class can give significant post-probability for the tracked target's trajectory" at section 3.4, paragraph 2, line 5).

Regarding **claim 14**, Lou et al. discloses a method wherein subsequent active alarm signals are inhibited if caused by an abnormal track within a predetermined distance of another track which has previously generated an alarm ("At the same time, a new class leaf is added into the tree at a proper layer" at section 3.4, paragraph 2, line 9; once the track has its own class, it won't be classified as abnormal as it has its own class characteristics).

Regarding **claim 15**, Lou et al. discloses an apparatus for processing video images to detect an event of interest ("visual surveillance system" at section 2, line 1; "semantic interpretation of vehicles and pedestrians' behaviors is proposed for applications in visual traffic surveillance" at section 1.1, paragraph 2, line 8), comprising:

a source of video images, which produces a video signal representing the video images to be processed (“image sequence used in our experiments is captured from a high building top with a Panasonic® video camera" at section 3.3., paragraph 3, line 6);

a feature extraction device that receives the video signal, and produces data representing at least one point feature detected within the image (“more than 400 trajectories are used” at section 3.3, paragraph 3, line 8);

a feature tracking device that receives the data representing said at least one point feature, and produces data representing a track that is representative of position and velocity of each of said at least one point feature within the image (“recording the position, speed and direction of the target at each frame” at section 2, line 11);

a learning device that receives the data representing tracks of said at least one point feature, and derives a normal range of behavior of each position within the video images in terms of observed incidences of point feature velocity at said each position in response to operation of a learning process on the data representing the tracks (“Trajectory pattern analysis which can automatically classify the trajectories into several patterns” at section 3.1, paragraph 1, line 1; “Learning of trajectory patterns” at section 3);

a classification device that receives both the signal representing the normal range of behavior and the data representing the tracks, and is adapted to compare the signal and the data for a corresponding position within the video images and to issue a normal/abnormal signal in accordance with the outcome of such comparison (“comparing translational speeds and angular speeds” at section 3.3, paragraph 1, line

17; “trajectory will be classified into the class which gives significant larger post-probability than all other classes” at section 3.4, paragraph 1, line 22); and

a generation device that receives the normal/abnormal signal and generates at least one active signal in response to the normal/abnormal signal indicating abnormal behavior of at least one track (“we can assert that this target is conducting an abnormal behavior, and a warning can be raised" at section 3.4, paragraph 2, line 7).

While the warning signal of Lou et al. is not explicitly an alarm signal, it only follows that the warning signal act as alarm so as to indicate to the user that abnormal activity is occurring and may require further attention.

11. Claims 3, 4, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Lou et al. and Schwerdt et al. (“Visual Recognition of Emotional States”, ICMI).

Regarding **claims 3 and 4,** Lou et al. discloses a method wherein the learning process accumulates data representing the behavior of the track(s) over a period of time using four dimensions representing x-position, y-position, x-velocity and y-velocity, of the track(s) within the video image (“$d_{i,j}$” at section 3.4, paragraph 1, line 9; “comparing translational speeds and angular speeds” at section 3.3, paragraph 1, line 17) wherein the learn behavior stage segregates the tracks according to a velocity threshold (see list at section 3.3, paragraph 1, from fourth to last line to last line); tracks moving at a velocity below the velocity threshold are considered stationary (“Stop $v<0.5$” at section 3.3, paragraph 1, last line) while tracks moving at a velocity in excess

of the velocity threshold are considered mobile ("Move Forward v>0.5" at section 3.3, paragraph 1, fourth to last line); data concerning the mobile tracks is stored.

Lou et al. does not explicitly disclose that data concerning the stationary tracks is stored in a two-dimension histogram representing x-position and y-position within the video image.

However, it is well-known in the art to utilize two-dimensional histograms to store position data and therefore would have been obvious at the time the invention was made to store the stationary data of Lou et al. in a two-dimensional histogram.

Lou et al. does not disclose that the data concerning the mobile tracks is stored in a four-dimensional histogram.

Schwerdt et al. discloses a method in the same field of endeavor of object tracking and recognition that accumulates data representing the behavior of the mobile track(s) over a period of time in a four-dimensional histogram ("four dimensional histogram" at section 3.2, paragraph 4, line 1).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize the 4-D histogram of Schwerdt et al. to keep track of the mobile data of Lou et al. "because the memory space requirements are lower" (Schwerdt et al. at section 3.2, paragraph 6, line 8).

Regarding **claim 7**, the Lou et al. and Schwerdt et al. combination discloses a method wherein the comparison process classifies a track according to a comparison of the frequency of occupation of a histogram cell representing a corresponding position

and velocity within the video images with an occupancy threshold (Schwerdt et al. at Table 2).

Regarding **claim 8**, the Lou et al. and Schwerdt et al. combination discloses a method wherein the comparison process acts to classify as normal behavior a track adjacent or near a cell ("trajectory will be classified into the class which gives significant larger post-probability than all other classes" at section 3.4, paragraph 1, line 22) which is above the occupancy threshold, despite the track appearing in a cell below the occupancy threshold, where one cell is considered to be near another if the distance between them is below a predetermined distance threshold ("distance from one point in a trajectory A to the corresponding point in the representative trajectory" at section 3.4, paragraph 1, line 7; "trajectory will be classified into the class which gives significant larger post-probability than all other classes" at section 3.4, paragraph 1, line 22).

12. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Lou et al. and Kamin (US 4,198,653).

Watanabe discloses the elements of claim 1 as described in the 103 rejection above.

Lou et al. does not disclose that subsequent active alarm signals are inhibited for a predetermined time interval after a first active alarm signal has been produced.

Kamin discloses a method in the same field of endeavor of video tracking wherein subsequent active alarm signals are inhibited for a predetermined time interval after a first active alarm signal has been produced ("first alarm pulse A' (Fig. 3d), which

originates from field 2 and which would normally result in a spurious alarm, is sppressed at the right time" at col. 4, line 24).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize the delay of Kamin in the alarm generation device of Lou et al. to provide "high sensitivity with respect to events which are relevant to a genuine alarm" (Kamin at col. 1, line 59).

13. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Lou et al. and Schwerdt et al. as applied to claim 3 above, and further in view of Zuniga (US 5,546,474).

The Lou et al. and Schwerdt et al. combination discloses the elements of claim 3 as described in the 103 rejection above.

The Lou et al. and Schwerdt et al. combination does not disclose that a cell size of the histogram varies with speed.

Zuniga discloses a method in the same field of endeavor of region detection wherein a cell size ("size of a cell can vary" at col. 10, line 14) of the histogram varies with speed ("moment of inertia" at col. 10, line 9).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize the cell varying of Zuniga in the histogram of the Lou et al. and Schwerdt et al. combination to allow the user to evaluate a "performance/quality tradeoff" (Zuniga at col. 10, line 15).

14. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Lou et al. and Schwerdt et al. as applied to claim 3 above, and further in view of Jepson et al. (US 7,058,205).

The Lou et al. and Schwerdt et al. combination discloses the elements of claim 3 as described in the 103 rejection above.

The Lou et al. and Schwerdt et al. combination does not disclose that the histogram is periodically de-weighted in order to bias the result of the learning process towards more recent events.

Jepson et al. discloses a method in the same field of endeavor of motion tracking wherein the histogram is periodically de-weighted in order to bias the result of the learning process towards more recent events ("up-weight the more recent frames" at col. 3, line 19).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize the weight varying of Jepson et al. to the histogram of the Lou et al. and Schwerdt et al. combination such that a "optimal motion estimation is achieved" (Jepson et al. at col. 3, line 12).

Response to Arguments

15. Applicant's arguments with respect to claims 1-15 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KATRINA FUJITA whose telephone number is (571)270-1574. The examiner can normally be reached on M-Th 8-5:30pm, F 8-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571) 272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Katrina Fujita/
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